



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------------------|-------------|----------------------|---------------------|------------------|
| 10/010,061 | 11/16/2001 | James G. Calvin | 0102314-00145 | 2762 |
| 21125 | 7590 | 11/29/2005 | EXAMINER | |
| NUTTER MCCLENNEN & FISH LLP | | | AHN, SAM K | |
| WORLD TRADE CENTER WEST | | | ART UNIT | |
| 155 SEAPORT BOULEVARD | | | PAPER NUMBER | |
| BOSTON, MA 02210-2604 | | | 2637 | |

DATE MAILED: 11/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

OK

| | | | | |
|------------------------------|-----------------|--|------------------|--|
| Office Action Summary | Application No. | | Applicant(s) | |
| | 10/010,061 | | CALVIN, JAMES G. | |
| | Examiner | | Art Unit | |
| | Sam K. Ahn | | 2637 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 March 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>62702,70202</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the *"amplitude modulated (AM) signal", as claimed in claim 5* and *"applies to the transformer logic a signal of fixed duty cycle during a period in which an FSK signal is no being transferred"* as claimed in claim 17 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and

Art Unit: 2637

informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities: under the Background of the Invention, the priority date of the Provisional Application Serial No. 60/249,145 should be November 16,2000. Appropriate correction is required.
4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

5. Claims 2,4,8-10,12,14-31,49 and 50 are objected to because of the following

informalities:

In claim 2, line 3, "transformer," should be "transformer, and", line 5, "into an" should be "into the".

In claim 4, line 2, "a smart" should be "the smart".

In claim 8, line 2, "a first one of the control devices" should be "the first control device".

In claim 10, line 3, "device," should be "device, and".

Claim 12, line 2, recites standards of signal format. What version is the system supporting?

In claim 14, line 8, "encoded therein an" should be "encoded therein the".

In claim 23, line 12, "signal," should be "signal, and".

In claims 30 and 31, line 1, it appears that its dependency should be from claim 23, and not claim 21.

In claims 49 and 50, line 1, it appears that its dependency should be from claim 46, and not claim 44.

Claims 9,15-22,24-29 and 31, directly or indirectly depend on claim 8,14 or 23.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-50 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claims 1-50 recite wherein the FSK signal is an "analog FSK signal". In the specification, on page 16, the applicants somewhat explain "an analog signal" being transferred with FSK component, however, throughout the specification, the applicants do not further explain how "analog FSK signal" is generated and transmitted between devices. FSK signals, as is generally known in the art, is considered as a digital signal. Thus, the specification does not explain further how "an analog FSK signal" can be implemented in such a way as to enable one skilled in the art to which it pertains to make and/or use the invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6, line 2, recites "aforesaid modulator". It is unclear as to which modulator it is referring to, thus fails to particularly point out and distinctly claim the subject matter.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-4,7-11,13,32-36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feldman et al. USP 6,295,272 B1 (Feldman) in view of Harris et al. USP 4,897,854 (Harris) and Applicants' Admitted Prior Art (AAPA).

Regarding claims 1,7,8,13,32,33 and 38, Feldman teaches a method and an input/output circuit of a process control system of type that generates an analog frequency shift keying (FSK) signal for transfer across a shared media (see Fig.6) between first and second control devices (88,90 in Fig.6), the improvement wherein a modulator (40,48,52) that generates FSK signal (output of 48, note col.14, line 49) transferred by the shared media is encoded in a pulse width modulated (PWM) signal (NRZ signal encoded by PWM, note col.7, lines 3-6). Thus, Feldman teaches transmission of FSK signal (having AUX DATA SOURCE) encoded by PWM signal (having HS DATA SOURCE) wherein the output of the transmitter transmitted across the shared media is illustrated in Figure 4.

However, Feldman does not explicitly teach wherein the shared media comprises a transformer.

Harris teaches NRZ data encoded by PWM and transferred across a shared media (first transformer 24 and second transformer 36, see 24,54 in Fig.1, and note col.2, lines 62-67). Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of Harris in the system of Feldman by applying a transformer receiving the signal as illustrated in Fig.4 of Feldman and implementing the communication network (54 of Harris) for the purpose of transferring signals using transfer based isolation having lower cost, durability and reliability, as taught by AAPA (note p.3, lines 10-14), wherein AAPA further suggests that FSK signals are transferred across an isolation barrier having the transformer (see Fig.1).

Regarding claim 2,34 and 35, Feldman, as previously explained, teaches a modulator (40,48,52) that is associated with a first control device (88) and that generates the PWM signal (output of 40) and that converts the PWM signal transferred by the shared media (20, wherein explanation above teaches Harris transferring PWM signal across the transformer), and a demodulator that is associated with a second control device (90) and converts the PWM signal transferred back into the FSK signal to respective demodulators (84 for PWM and 74,50 for FSK).

Regarding claims 3,11 and 36, Feldman further teaches the further improvement wherein each of the first and second control devices are any of a workstation, field

Art Unit: 2637

controller, field device, smart field device, or other device for process control (note col.1, line 30-32).

Regarding claim 4, Feldman further teaches wherein the second control device (12 in Fig.1) is the smart field device (note col.1, line 30-32), and further comprising a transmitter (12 is a transceiver comprising a transmitter and a receiver) that is coupled to the demodulator (28) and that transmits the FSK signal to/from the second control device.

Regarding claims 9 and 10, Feldman further teaches wherein the modulator is coupled to a modem (modulator and demodulator in a transceiver, see 26 in Fig.1) that generates the FSK signal to be transferred from a digital signal (SUBCHANNEL DATA).

9. Claims 5,6,14-20,22,23-29,31,39-43,45-48 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feldman et al. USP 6,295,272 B1 (Feldman) in view of Harris et al. USP 4,897,854 (Harris) and Applicants' Admitted Prior Art (AAPA) and in further view of Saeki et al. USP 4,899,158 (Saeki).

Regarding claims 5,6,14,15,16,18,19,20,23-29,39-43 and 46-48, Feldman in view of Harris and AAPA teach all subject matter claimed, as applied to claim 1, however, do not explicitly teach wherein a further FSK signal transferred by the transformer is encoded in an amplitude modulated (AM) signal.

Saeki teaches a second device (10) generating FSK signal (output of 15 in Fig.1) encoded in an amplitude modulated (AM) signal (14, note col.3, lines 12-17). Therefore, by applying the AM modulator (14 of Saeki) in the second device of Feldman (12 in Fig.1) receive the output signal (28 in Fig.1 receiving FSK signal) and further modulate the unmodulated signal (oscillator 11 of Saeki), it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of Saeki in the system of Feldman for the purpose of increasing the data rate of the data being transmitted by the transmitter (note col.4, lines 30-49, wherein the AM modulated signal is further implemented to be used to carry data), hence achieve overall system increased data rate.

Saeki further teaches AM signal utilizing a carrier generated by a fixed duty cycle, wherein the oscillator provides clock signals, wherein the clocks output by the oscillator are well-known to one skilled in the art of providing the fixed duty cycle. Thus, Feldman in view of Harris and AAPA in view of Saeki teach all subject matter having a first device (10 in Fig.1 or 88 in Fig.6) generating PWM and FSK signal being transmitted to a second device (12 in Fig.1 or 90 in Fig.6) receiving the signals and generating PWM and AM signals as claimed.

Regarding claim 17, Feldman in view of Harris and AAPA teaches all subject matter claimed, as applied to claim 16, and although do not explicitly teach the further limitation of FSK signal not being transferred during a period, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to

analyze that when the SUBCHANNEL DATA (26 in Fig.1) is not being transferred the FSK signal would inherently not be transferred. Applicant has not disclosed that not transferring FSK signal provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well not transferring the SUBCHANNEL DATA because there would less process to be performed in the receiver to remove FSK signal and demodulate the PWM signal at the second device. Therefore, it would have been obvious to one of ordinary skill in this art to modify the system Feldman of not transferring the FSK signal when less interference is desired in the system to obtain the invention as specified in claim.

Regarding claims 22,31,45 and 50, Feldman further teaches the further improvement wherein each of the first and second control devices are any of a workstation, field controller, field device, smart field device, or other device for process control (note col.1, line 30-32).

10. Claims 12 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feldman et al. USP 6,295,272 B1 (Feldman) in view of Harris et al. USP 4,897,854 (Harris) and Applicants' Admitted Prior Art (AAPA) and in further view of Anderson et al. USP 6,297,691 B1 (Anderson).

Regarding claims 12 and 37, Feldman in view of Harris and AAPA teach all subject matter claimed, however, do not explicitly teach wherein the FSK signal

is compatible with any of a FoxComm, HART or other analog control signal format.

Anderson teaches FSK signals supporting FoxComm, HART or other analog control signal format (note col.1, lines 35-46). Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of Anderson in the system of Feldman for the purpose of providing the FSK signals onto the two-wire communications line, as taught by Anderson (note col.1, lines 44-46) wherein Feldman in view of Harris and AAPA as previously explained provides FSK being transmitted across the transformer coupled to the two-wire communications line.

11. Claims 21,30,44 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feldman et al. USP 6,295,272 B1 (Feldman) in view of Harris et al. USP 4,897,854 (Harris) and Applicants' Admitted Prior Art (AAPA) and in further view of Saeki et al. USP 4,899,158 (Saeki) and Anderson et al. USP 6,297,691 B1 (Anderson).

Regarding claims 21,30,44 and 49, Feldman in view of Harris and AAPA and in further view of Saeki and Anderson teach all subject matter claimed, however, do not explicitly teach wherein the FSK signal is compatible with any of a FoxComm, HART or other analog control signal format.

Anderson teaches FSK signals supporting FoxComm, HART or other analog control signal format (note col.1, lines 35-46). Therefore, it would have been

Art Unit: 2637


obvious to one skilled in the art at the time of the invention to incorporate the teaching of Anderson in the system of Feldman for the purpose of providing the FSK signals onto the two-wire communications line, as taught by Anderson (note col.1, lines 44-46) wherein Feldman in view of Harris and AAPA as previously explained provides FSK being transmitted across the transformer coupled to the two-wire communications line.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Ahn whose telephone number is (571) 272-3044. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sam K. Ahn
11/23/05


YOUNG T. TSE
PRIMARY EXAMINER